

Title (en)

Process for producing a ceramic layer on a metallic substrate

Title (de)

Verfahren zur Herstellung einer keramischen Schicht auf einem metallischen Grundwerkstoff

Title (fr)

Procédé de fabrication d'une couche de céramique sur un substrat métallique

Publication

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Application

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Priority

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Abstract (en)

A ceramic layer is produced on a metallic substrate (1) by applying a ceramic coating material onto a locally melted substrate surface region (10) where it reacts to form a metallurgical compound zone with an additive material which has been applied as an adhesion promoting layer on the substrate or added to the substrate as an alloying component. Independent claims are also included for: (i) equipment for carrying out the above process, including a large nozzle for supplying protective gas within the region of a laser beam and a small coating material supply nozzle (31), a movable workpiece holder (5) and an induction heater (4, 40) being positioned below the large nozzle outlet; and (ii) a workpiece (1) produced by the above process, the substrate and coating materials being chosen such that their thermal expansion coefficients and melting temperatures differ by not more than 50 (preferably 20)%. Preferred Features: The substrate is of low carbon ferritic steel and the coating material is an eutectic mixture of Al₂O₃ and ZrO₂ with NOTGREATER 10 wt.% additional oxides, e.g. chromium, titanium, yttrium-magnesium and/or calcium oxides. The reactive additive material, e.g. titanium, is present in metallic form.

Abstract (de)

Das Verfahren zur Herstellung einer keramischen Schicht (12, 13) auf einem metallischen Grundwerkstoff (1') kombiniert folgende Massnahmen: Der Grundwerkstoff wird vorgeheizt. Keramisches Beschichtungsmaterial (30) wird auf einen lokal geschmolzenen Oberflächenbereich(10) des Grundwerkstoffs aufgebracht. Dabei wird das Beschichtungsmaterial ebenfalls aufgeschmolzen. Mit einem Zusatzmaterial, das mit dem Beschichtungsmaterial reagiert und das auf dem Grundwerkstoff als Haftvermittlungsschicht (11) zusätzlich aufgebracht ist oder dem Grundwerkstoff als Legierungsbestandteil beigegeben ist, wird eine metallurgische Verbindungszone (12') erzeugt. <IMAGE>

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IPC 8 full level

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CPC (source: EP US)

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